HYDROLAB

Hydrolab – A Hach Company Brand is the world leader in multi-parameter water quality monitoring instrumentation with over **40 years** experience. Following is also a list of what makes our Hydrolab equipment so unique in the multi-parameter market.

DS5X Unique Features

The DS5X offers Hydrolab's Superior Sensor Technology on a platform that will dramatically extend your DataSonde deployment life!

- Ideal for "X-tended" deployments in environments where fouling and sediment are abundant.
- Further improved long-term value due to reduced frequency of sensor maintenance.
- Central cleaning system wipes away fouling on DO, pH, ISE's, Chlorophyll, and Turbidity.
- One central motor cleans the entire suite of sensors – minimizes power consumption!
- Hydrolab's brush design features robust fibers that won't separate over time.

No Conectorized Sensors

Hydrolab has moved away from this type of sensor connection (we used it on our previous series of equipment). When changing sensors in the field dirt & moisture can become trapped in the (lemo) connector of the sensors as the electronic connection is made in the end cap of the instrument. On Hydrolab Series 4a equipment you can replace sensors in the field if necessary, however, the sensor connection is made inside the Sonde housing to protect connections from the elements.

It must be noted that when moving a connectorized field replaceable sensor from one Sonde to another in the field, the stated spec is no longer valid, the actual spec doubles. So, a +/- 0.2 mg/l spec for DO changes to +/- 0.4 mg/l, *this is no advantage when quality data is needed*.

At this point please note our **industry best** full "bumper to bumper" two-year warranty on our entire line of equipment and sensors. Please be aware of other vendors' shorter sensor warranties and much shorter sensor life requiring you to purchase replacement sensors on a regular basis. The cost of ownership of Hydrolab is very low as we have rebuildable Dissolved Oxygen and pH sensor references, these references can be rebuilt in seconds, not replaced with new ones.

Fresh-Flow Sample Circulator

The circulator has several benefits. First, it provides adequate flow across the dissolved oxygen sensor to insure the most accurate readings. **This flow is required for compliance with EPA Method 360.1, the EPA method for measuring dissolved oxygen in water with an electronic sensor.**

Beyond that, the circulator provides assurance that a representative sample is being measured and it reduces the rate of sensor fouling.

Dissolved Oxygen Sensor

Hydrolab uses a long-lived, oxygen-consumptive steady state sensor. This sensor provides high quality data over the entire range of readings and continues to be the most durable available. Other sensors on the market are less durable engineering compromises to the steady sensor. These reengineered sensors were developed to reduce power consumption during long-term deployments. They do not measure dissolved oxygen directly but use an algorithm to *estimate* oxygen concentration from the energy it takes to restore the charge to the sensor. **The Hydrolab unit will update the display every second while the pulse systems update the information at four-second intervals.** Pulse sensors tend to wear out within 12 months while several years should be expected from the Hydrolab dissolved oxygen sensor. With the low

power Fresh-Flow Circulator, long deployments can be accomplished without compromising dissolved oxygen precision.

The Hydrolab dissolved oxygen sensor does not require regular reconditioning. Consequently, the user does not need to purchase a reconditioning kit and does save significant maintenance time.

NEW! Hach LDO™

Hach LDO integrated into the Hydrolab Series 5 instruments is the most significant breakthrough technology for multi-parameter water quality monitoring instruments in years! The key benefits of the Hach LDO sensor are as follows:

- **Calibrations last longer than ever before without drift, so deployment length is improved**
  - No anode or electrolyte to consume means extremely stable measurements
  - DO *was* the limiting factor in deployment length, so now site visits are reduced
- **No membranes to replace**
  - Maintenance of the sensor is limited to wiping the sensor clean
  - No special skills are required to changes a sensor cap… no stretching membranes, no worrying about air bubbles, no waiting for membranes to relax
  - No risk of membrane failures such as tearing
  - No consumable anodes, membranes, or electrolyte to be maintained or replaced with every calibration
- **Improved accuracy and stability gives users the best DO data**
- **Other important notes about Hach LDO™**
  - Hach is the world leader in LDO technology. The company has built and shipped thousands of LDO sensors for use in the wastewater, industrial, and laboratory markets.
  - Hach LDO™ is designed, manufactured, and serviced in Loveland, CO. This means that our customers can receive sales support directly from the source!
  - Hach LDO™ is completely integrated into the Series 5 Sondes. Therefore, the sensor can be brushed by our DS5X to remove any active fouling (i.e. barnacles) that consume oxygen and would otherwise misrepresent the condition of the water.

Rebuildable pH Reference Electrode

Hydrolab's reference electrode is rebuildable. The user can replace the reference electrolyte and the porous Teflon junction. This provides the user improved field readings and much longer life when compared to gel filled combination electrodes. The sensor can be rebuilt in minutes in the field.

Because they are rebuildable, these sensors will last many times the length of life of the gel filled pH sensors that other manufacturers use. **Gel filled sensors typically need replacement in 8-15 months while a rebuildable sensor should last many years. These replacements cost +/- $ 200.00**

Graphite Conductivity Sensor

Hydrolab's graphite conductivity sensor eliminates the need to polish nickel electrodes and provides for improved sample flow past the sensor. No longer will you need to be concerned with bubbles or sediment in a conductivity block or whether you are measuring a representative sample. The new open design has better accuracy as well.

Self-Cleaning Turbidity

The self-cleaning turbidity sensor offers higher accuracy turbidity measurements and a wiper mechanism to reduce the effects of fouling. The sensor is available as an option on the DataSonde 4a. Our turbidity sensor has a 0 to 3,000 NTU measurement range with very high resolution across the entire range!

The sensor uses a nephelometric method based on ISO 7027 (International Standard, Second Edition 1990-04-15). **Some competitive sensors do not!** The sensor measures the intensity of light scattered by particles in the water sample at 90° from an 880 nm light source. The readings are displayed as NTU. The sensor also uses electronic modulation/demodulation techniques to reject errors due to ambient light. The sensor optics are located on the bottom of the sensor body. The optical path extends approximately 25.4 mm (1 in.) from the bottom of the sensor to the bottom of the calibration cup (or sensor guard). The path must be free of obstructions that can cause errors in the turbidity readings. An internal motor automatically wipes the optical face at the start of every measurement. A user-definable parameter makes a number of extra wipes before every measurement, in addition to the first automatic wipe.

Integrated Chlorophyll a, Rhodamine WT, & Blue-Green Algae (cyanobacteria)

The new Chlorophyll *a* and Rhodamine WT sensors, developed by Turner Designs, offer several benefits for operators, including: • Ultra-compact size designed and cost optimized by Turner Designs specifically for integration into the DataSonde. • Turner's industry leading measurement capabilities have not been compromised – this is the highest performance submersible flourometer available! • Excellent turbidity rejection ensures superior detection limits in a wide range of environmental conditions. • Three auto-selected gain ranges provide a wide measurement range of 0.03 to 500 µg/l for Chlorophyll a and 0.04 to 1000 ppb for Rhodamine WT. • Turner's unique Secondary Standards to provide a quick and simple method to verify the sensor's stability over time. • The Secondary Standard can also be adjusted to correlate to a known chlorophyll or dye concentration.

The new Blue-Green Algae sensors offer several benefits for researchers, including:
• Early quantitative detection of harmful algal blooms before they become problematic.
• Signal the need for corrective action water treatment before unsafe conditions arise.
• Differentiate harmful algal blooms from non-toxic algae.
• AND this is the only Blue-Green Algae sensor available for any multi-parameter Sonde!

TDG Sensor

The instrument shall be capable of measuring Total Dissolved Gas in the range of 0 to 1550 mm Hg with an accuracy of 0.1% of range. The sensor should be integrated into the end of the Sonde.

Warranty

Hydrolab offers a standard two-year warranty on all components except for consumable sensors (ion selective sensors – 6 months). Only Hydrolab offers an optional extended warranty for up to an additional 3 years. Hydrolab can do this because the units are proven to be durable. Compare this to manufacturers that will warrant their sensors for only six months to a year.

Surveyor Data Display Unique Features

Waterproof Enclosure

Only Hydrolab has a display with a NEMA 6 waterproof rating.

Rechargeable Battery

The rechargeable battery is a metal nickel hydride battery that will provide the user 12 or more hours of continuous operation. The battery does not have the memory problems associated with NiCad batteries and the battery can be topped off rather than having to be

discharged prior to recharging. The battery can be replaced in less than 5 minutes using only a screwdriver and when being replaced, does not require opening the circuitry compartment.

Graphics Capability

The Surveyor 4a has the unique ability to graphically display any enabled parameter versus time or depth. The axes can be rotated 90 degrees into standard limnological format.

One Handed Operation

The 11 keys are large enough and spaced far enough apart so that the unit can be operated with a single gloved hand. Other displays have many small closely spaced keys that reduce the ease of operation, especially in wet and cold conditions.

Memory Size

The memory option is for 1.5 Meg. The user can set up as many as 24 files for storing data. File templates can be set up using the Wipe function. The user can insert messages into any file using the Annotate function.

Barometer and GPS options

The barometer option allows the user to conduct accurate dissolved oxygen calibrations when other sources of pressure information are unavailable. By logging the barometric pressure data along with the dissolved oxygen saturation information, the user can better quantify the oxygen saturation data. The Surveyor 4a display is the only one that offers the GPS option.

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